



US 20170162359A1

(19) **United States**(12) **Patent Application Publication****Tang et al.**(10) **Pub. No.: US 2017/0162359 A1**(43) **Pub. Date: Jun. 8, 2017**(54) **ELECTRON SOURCE, X-RAY SOURCE AND  
DEVICE USING THE X-RAY SOURCE****Publication Classification**(51) **Int. Cl.****H01J 35/06** (2006.01)**H01J 35/14** (2006.01)(52) **U.S. Cl.****CPC** ..... **H01J 35/065** (2013.01); **H01J 35/14**  
(2013.01); **H01J 2235/062** (2013.01)(71) Applicant: **NUCTECH COMPANY LIMITED,**  
Beijing (CN)(72) Inventors: **Huaping Tang,** Beijing (CN); **Zhiqiang  
Chen,** Beijing (CN); **Yuanjing Li,**  
Beijing (CN); **Yonggang Wang,** Beijing  
(CN); **Zhanfeng Qin,** Beijing (CN)(21) Appl. No.: **14/904,061**(22) PCT Filed: **Aug. 19, 2015**(86) PCT No.: **PCT/CN2015/087488**

§ 371 (c)(1),

(2) Date: **Jan. 8, 2016**(30) **Foreign Application Priority Data**

Aug. 25, 2014 (CN) ..... 201410419359.2

(57)

**ABSTRACT**

The present disclosure is directed to an electron source and an X-ray source using the same. The electron source of the present invention comprises: at least two electron emission zones, each of which comprises a plurality of micro electron emission units, wherein the micro electron emission unit comprises: a base layer, an insulating layer on the base layer, a grid layer on the insulating layer, an opening in the grid layer, and an electron emitter that is fixed at the base layer and corresponds to a position of the opening, wherein the micro electron emission units in the same electron emission zone are electrically connected and simultaneously emit electrons or do not emit electrons at the same time, and wherein different electron emission zones are electrically partitioned.

